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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/741,940 | 12/20/2000 | Zhigang Rong | NC17510 (NOKI02-17510) | 5743 |

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SCHEEF & STONE, L.L.P.
5956 SHERRY LANE
SUITE 1400
DALLAS, TX 75225

| EXAMINER | |
|---|---|
| MOORE JR, MICHAEL J | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2666 | |

DATE MAILED: 12/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/741,940 | RONG ET AL. | |
| | Examiner | Art Unit | |
| | Michael J. Moore, Jr. | 2666 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *30 July 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 July 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Drawings*

1. Corrected drawings including changes to Figures 1 and 3 were received on 8/5/2004. These drawings are acceptable. The objections to the drawings stated in the previous Office Action have been withdrawn. However, it is requested that formal drawings be submitted incorporating the corrections.

### *Specification*

Amendments made to the specification to obviate the objections stated in the previous Office Action are proper and have been entered. The objections have been withdrawn.

### *Claim Objections*

Amendments made to claims **1, 13, 14, and 21** to obviate the objections stated in the previous Office Action are proper and have been entered. The objections have been withdrawn.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims **1-13 and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ghosh et al. ("Ghosh") (U.S. 6,366,601) in view of Chuang et al. ("Chuang") (U.S. 6,823,005).

Regarding claim **1**, Ghosh teaches an apparatus where data is communicated between a source user and a destination user over a downlink channel in Figure 1 as well as column 1, lines 59-66. Ghosh also teaches the selection of a modulation/coding scheme 111 (first communication indicia) at encoder/modulator 107 (comparator/selector) of Figure 1 based upon a carrier quality criteria such as carrier to interference ratio (traffic-channel threshold) as spoken of on column 2, line 66 – column 3, line 5. Ghosh also teaches the selection of a spreading code 108 (second communication indicia) according to a selected modulation/coding scheme 111 at encoder/modulator 107 as spoken of on column 3, lines 5-10 as well as column 4, lines 18-22. Ghosh also teaches a table shown in Figure 1 that contains different MCS values and corresponding code rates that is referenced by encoder/modulator 107.

Ghosh fails to explicitly teach a storage device having memory locations for storing a matrix containing threshold values of the first and second communication indicia. However, Chuang teaches a method of link adaptation where signal quality is

compared to a threshold value and a corresponding adaptation mode is selected. Figure 2 of Chuang shows a matrix of information that contains threshold levels 260 (1-N) that correspond to a certain signal-to-interference ratio as well as a certain modulation/coding scheme 210. These thresholds are used in order to select an appropriate modulation/coding scheme based on the measured signal-to-interference ratio as spoken of on column 2, lines 14-23 of Chuang. At the time of the invention, it would have been obvious to someone skilled in the art given these references to integrate the modulation/coding scheme selection based on comparison of signal quality to threshold values as taught in Chuang into the MCS and spreading code selection table (matrix) of Ghosh in order to maximize throughput in the system through selection of an appropriate adaptation mode as spoken of on column 2, lines 18-23 of Chuang.

Regarding claim **2**, Ghosh further teaches data transmission system of Figure 1 that makes use of different coding rates 110 and different spreading codes 108. Ghosh also further teaches spreading codes 108 (first communication indicia) in Figure 1.

Regarding claim **3**, Ghosh further teaches a CDMA system in Figure 1 with a plurality of Walsh codes 108 as spoken of on column 3, lines 26-29.

Regarding claim **4**, Ghosh further teaches data transmission system of Figure 1 that makes use of different coding rates 110 and different spreading codes 108. Ghosh also further teaches MCS values 111 (second communication indicia) shown in Figure 1.

Regarding claim **5**, Ghosh further teaches multiple MCS schemes 111 (levels) in Figure 1.

Regarding claims **6 and 7**, Ghosh further teaches data transmission system of Figure 1 that contains a base station (network infrastructure) as well as a mobile station as spoken of on column 1, lines 51-61. Ghosh also teaches encoder/modulator 107 (storage device), which stores tables containing MCS schemes 111 (indicia).

Regarding claim **8**, Ghosh further teaches the use of carrier-to-interference ratio of a communication between a source and a destination for selection of an appropriate modulation/coding scheme.

Regarding claim **9**, Ghosh further teaches data transmission in Figure 1 between a base station (network infrastructure) and a mobile station as spoken of on column 1, lines 51-61.

Regarding claims **10 and 11**, Ghosh further teaches the use of carrier-to-interference ratio of a communication between a source and a destination for selection of an appropriate modulation/coding scheme.

Regarding claim **12**, Ghosh further teaches encoder/modulator 107 used to code and modulate data.

Regarding claim **13**, Ghosh further teaches encoder/modulator 107 that uses a plurality of Walsh codes 108 as spoken of on column 3, lines 26-29.

Regarding claim **20**, Ghosh teaches a method where data is communicated between a source user and a destination user over a downlink channel in Figure 1 as well as column 1, lines 59-66. Ghosh also teaches the selection of a modulation/coding scheme 111 (first communication indicia) at encoder/modulator 107 (comparator/selector) of Figure 1 based upon a carrier quality criteria such as carrier to

interference ratio (traffic-channel threshold) as spoken of on column 2, line 66 – column 3, line 5. Ghosh also teaches the selection of a spreading code 108 (second communication indicia) according to a selected modulation/coding scheme 111 at encoder/modulator 107 as spoken of on column 3, lines 5-10 as well as column 4, lines 18-22. Ghosh also teaches a table shown in Figure 1 that contains different MCS values and corresponding code rates that is referenced by encoder/modulator 107.

Ghosh fails to explicitly teach forming a matrix containing threshold values of the first and second communication indicia. However, Chuang teaches a method of link adaptation where signal quality is compared to a threshold value and a corresponding adaptation mode is selected. Figure 2 of Chuang shows a matrix of information that contains threshold levels 260 (1-N) that correspond to a certain signal-to-interference ratio as well as a certain modulation/coding scheme 210. These thresholds are used in order to select an appropriate modulation/coding scheme based on the measured signal-to-interference ratio as spoken of on column 2, lines 14-23 of Chuang. At the time of the invention, it would have been obvious to someone skilled in the art given these references to integrate the modulation/coding scheme selection based on comparison of signal quality to threshold values as taught in Chuang into the MCS and spreading code selection table (matrix) of Ghosh in order to maximize throughput in the system through selection of an appropriate adaptation mode as spoken of on column 2, lines 18-23 of Chuang.

5. Claims **14-19 and 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ghosh et al. ("Ghosh") (U.S. 6,366,601) in view of Chuang et al. ("Chuang") (U.S. 6,823,005) and in further view of Tiedemann, Jr. et al. ("Tiedemann") (U.S. 6,335,922).

Regarding claims **14 and 21**, Ghosh in view of Chuang teaches the apparatus of claim **1** and the method of claim **20**. Ghosh in view of Chuang fails to teach a scheduler that is used to schedule shared access to a channel shared between a first and a second station as well as the first and a third station. However, Tiedemann teaches a scheduler 12 within base station controller 10 in Figure 2 that is used to schedule the use of channels between a base station 4 and mobile station(s) 6. At the time of the invention, it would have been obvious to someone skilled in the art given these references to combine the data transmission apparatus of Ghosh in view of Chuang with the channel scheduler of Tiedemann. A motivation for doing so would be to use channel scheduling for improved utilization of the forward link as stated in column 8, lines 1-10 of Tiedemann.

Regarding claims **15 and 19**, Ghosh in view of Chuang teaches the apparatus of claim **1**. Ghosh in view of Chuang fails to teach the apparatus of claim **14** where the scheduler schedules channel access based on a traffic channel threshold value. Ghosh in view of Chuang also fails to teach where the scheduler schedules channel access based upon a quality of service (QoS). However, Tiedemann teaches that channel scheduler 12 of Figure 1 is tasked with the function of allocating resources to each scheduled user by transmitting as many scheduled and unscheduled tasks as can be supported within system capacity constraints (traffic channel threshold value) to improve

quality in the communication by increasing the transmission rate and thus minimizing the transmission delay of the data (QoS). At the time of the invention, it would have been obvious to someone skilled in the art given these references to combine the data transmission apparatus of Ghosh in view of Chuang with the channel scheduler of Tiedemann. A motivation for doing so would be to use channel scheduling for improved utilization of the forward link as stated in column 8, lines 1-10 of Tiedemann.

Regarding claims **16-18**, Ghosh in view of Chuang teaches the apparatus of claim **1** where packet data is communicated as shown in Figure 2. Ghosh in view of Chuang fails to teach the apparatus of claim **15** where a timer is used for timing periods of pendency of packet data at a buffer prior to channel access. Ghosh in view of Chuang also fails to teach where the scheduler schedules channel access based upon this packet pendency within a buffer. However, Tiedemann teaches a timing element 96 within scheduler 12 in Figure 3 that provides controller 92 with the timing signals necessary to perform scheduling (manages data in queue) of the forward link as stated in column 8, lines 31-35. Tiedemann also teaches a memory element 94 within scheduler 12 of Figure 3 that contains a queue (buffer) that contains the data to be transmitted to remote station(s) 6. At the time of the invention, it would have been obvious to someone skilled in the art given these references to combine the data transmission apparatus of Ghosh in view of Chuang with the timing element and channel scheduler of Tiedemann. A motivation for doing so would be to use channel scheduling for improved utilization of the forward link as stated in column 8, lines 1-10 of Tiedemann.

***Response to Arguments***

6. Applicant's arguments with respect to claims **1 and 20** have been considered but are moot in view of the new ground(s) of rejection provided above.

***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Olofsson et al. (U.S. 6,167,031) also contains material pertinent to the instant application.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Moore, Jr. whose telephone number is (571)

272-3168. The examiner can normally be reached on Monday-Friday (8:30am - 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema S. Rao can be reached at (571) 272-3174. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michael J. Moore, Jr.
Examiner
Art Unit 2666

mjm MM

FRANK DUONG
PRIMARY EXAMINER